

IN THE CLAIMS

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1 1. (Currently amended) An antenna structure comprising:  
2  
3 at least one antenna element, the at least one antenna element having at  
4 least one taper; and  
5  
6 a symmetrical finite ground plane coupled with the at least one antenna  
7 element.

1 2. (Original) The antenna structure of Claim 1, wherein the at least one  
2 antenna element comprises a travelling wave antenna supporting a phase  
3 velocity greater than the speed of light.

1 3. (Original) The antenna structure of Claim 1, wherein the taper comprises a  
2 linear profile, a linear constant profile, a broken-linear profile, an exponential  
3 profile, an exponential constant profile, a tangential profile, a step-constant  
4 profile, or a parabolic profile.

1 4. (Original) The antenna structure of Claim 1, wherein the antenna structure  
2 supports a cigar-like directional three-dimensional beam pattern and a butterfly  
3 wing-like directional three-dimensional beam pattern.

1 5. (Original) The antenna structure of Claim 1, wherein the at least one  
2 antenna element is positioned at an angle from the symmetrical ground plane.

1 6. (Currently amended) The antenna structure of Claim 5, wherein the angle  
2 is about 90 degrees with respect to the x-, y- and z- axes.

1 7. (Original) The antenna structure of Claim 1, wherein the at least one  
2 antenna element is coupled with the symmetrical ground plane by means of an  
3 unbalanced impedance.

1 8. (Original) The antenna structure of Claim 7, wherein the unbalanced  
2 impedance comprises a coaxial cable.

1 9. (Original) The antenna structure of Claim 7, wherein a first conductor of  
2 the unbalanced impedance mechanically couples the at least one antenna  
3 element with the symmetrical ground plane.

1 10. (Original) The antenna structure of Claim 1, wherein the symmetrical  
2 ground plane is disk shaped.

1 11. (Currently Amended) An antenna structure comprising:  
2  
3 an array of at least two antenna elements, each antenna element having at  
4 least one taper;  
5

6 a symmetrical finite ground plane; and  
7  
8 an unbalanced impedance for coupling the array of at least two antenna  
9 elements with the symmetrical ground plane.

1 12. (Original) The antenna structure of Claim 11, wherein at least one antenna  
2 element of the array comprises a travelling wave antenna supporting a phase  
3 velocity greater than the speed of light.

1 13. (Original) The antenna structure of Claim 11, wherein the taper of at least  
2 one antenna element of the array comprises a linear profile, a linear constant  
3 profile, a broken-linear profile, an exponential profile, an exponential constant  
4 profile, a tangential profile, a step-constant profile, or a parabolic profile.

1 14. (Original) The antenna structure of Claim 11, wherein each antenna  
2 element of the array supports a cigar-like directional three-dimensional beam  
3 pattern and a butterfly wing-like directional three-dimensional beam pattern.

1 15. (Original) The antenna structure of Claim 11, wherein each antenna  
2 element of the array is positioned at an angle from the symmetrical ground  
3 plane.

1 16. (Currently amended) The antenna structure of Claim 15, wherein the  
2 angle for each antenna element is about 90 degrees with respect to the x-, y- and  
3 z- axes.

1 17. (Original) The antenna structure of Claim 11, wherein the unbalanced  
2 impedance comprises a coaxial cable.

1 18. (Original) The antenna structure of Claim 17, wherein a first conductor of  
2 the unbalanced impedance mechanically couples each antenna element of the  
3 array with the symmetrical ground plane.

1 19. (Original) The antenna structure of Claim 11, wherein the symmetrical  
2 ground plane is disk shaped.

1 21. (Currently Amended) An apparatus comprising:  
2  
3 a transceiver; and  
4  
5 an antenna structure for radiating or capturing electromagnetic energy  
6 from or to the transceiver comprising:

7  
8 at least one antenna element having at least one taper, the taper  
9 comprising a linear profile, a linear constant profile, a broken-linear  
10 profile, an exponential profile, an exponential constant profile, a  
11 tangential profile, a step-constant profile, or a parabolic profile;

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a symmetrical disk shaped finite ground plane, the at least one

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antenna element being positioned at an angle from the symmetrical

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disk shaped finite ground plane; and

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an unbalanced impedance for coupling the at least one antenna

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element with the symmetrical disk shaped finite ground plane.

- 8' Cont'd*
- 1 22. (Original) The apparatus of Claim 21, wherein the at least one antenna  
2 element supports a cigar-like directional three-dimensional beam pattern and a  
3 butterfly wing-like directional three- dimensional beam pattern.

- 1 23. (Currently amended) The antenna structure of Claim 21, wherein the  
2 angle is about 90 degrees with respect to the x-, y- and z- axes.

- 1 24. (Original) The antenna structure of Claim 21, wherein the unbalanced  
2 impedance comprises a coaxial cable.

- 1 25. (Original) The antenna structure of Claim 21, wherein a first conductor of  
2 the unbalanced impedance mechanically couples the at least one antenna  
3 element with the symmetrical ground plane.
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